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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/801,821	06/22/2004	Fumio Koyama	111587.01	2538
25944	7590	02/09/2005	EXAMINER	
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			MULPURI, SAVITRI	
			ART UNIT	PAPER NUMBER
			2812	

DATE MAILED: 02/09/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/801,821	KOYAMA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Savitri Mulpuri	2812	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-5 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 10/026,637.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |  |
|--|--|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>3/17/2004/7/23/2004</u> . | 6) <input type="checkbox"/> Other: ____  |

### **DETAILED ACTION**

This application is divisional application of pending parent application 10/026,637. This action is in response to the applicant's communication filed on 3/17/2004 and 7/23/2004.

#### ***Claim Objections***

Claims 1-5 objected to because of the following informalities: etching preventing  
Appropriate correction is required. It is suggested to amend "etch preventing" in place of "etching preventing".

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Martinsson et al (IEEE Photonics Technology Letters 1999) in combination with Shieh et al (US 5,293,392).

Martinsson et al teaches a method of making surface emitting semiconductor by the following process steps: Forming on a main surface of the semiconductor substrate successively forming lower reflection layer, quantum well layer and upper reflection layer, wherein the successive layers in sequence forms laminate structure as recited in

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claims 3 and 4; forming a metal contact layer; forming a post portion in the shape of the pillar with at least the upper reflection layer partially remaining; forming a boundary region for suppressing light emission of oscillation modes except for specific oscillation mode; and substantially forming light emitting spot corresponding to the specific oscillation mode by processing apart of the region of the surface of the upper reflection layer which is exposed to the surface of the post portion. (see publication from IDS, for fig.1, 3 a-3b and page 1041, right column)

Martinsson does not teach (1) a surface layer on top of upper reflection layer, (2) etch preventing layer on the lower side of the surface layer.

Shieh et al teaches, prior to forming metal contact layer, forming transparent doped semiconductor contact layer "22" on the upper mirror layer "18"; and then followed by metal contact. Shieh et al also teaches etch stop layer "20" on the lower side of the contact layer. It would have been obvious to one of ordinary skill in the art to form transparent doped semiconductor layer prior to the formation of metal contact in the invention of Martinsson et al because such contact layer acts as a surface layer as recited in instant claims and gives the advantage of improved ohmic contact for VCSEL and at the same time acts as a light emitting region because such layer would be transparent layer for light transmission. It also would have been obvious to one of ordinary skill in the art to form etch stop layer in the invention of the Martinsson et al because etch stop would control the depth of the mesa emitting area, thereby obtaining mesa structure with intended depth confining current flow and lasing to the mesa (see abstract).

Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Allowable Subject Matter***

The following is an examiner's statement of reasons for allowance: Prior art neither teach nor suggest laminating the etch preventing layer on the lower side of the surface layer.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Savitri Mulpuri whose telephone number is 571-272-1677. The examiner can normally be reached on Mon-Fri from 8 a.m to 4.30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt, can be reached on 571-272-1873. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

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published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).



Savitri Mulputi  
Primary Examiner  
Art Unit 2812